
Aeronautics Committee Report to the NASA Advisory Council

Gen. Lester Lyles (Chairman)

Dr. John Sullivan

Dr. Gene Covert

Dr. Ilan Kroo

Dr. Ray Colladay (ex-officio)

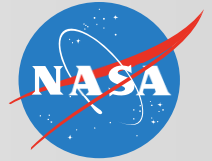
Ms. Marion Blakey

Mr. Pres Henne

July 16, 2009

Areas of Interest Explored at Current Meeting

- Vision for ARMD and FY2010 President's Budget – Dr. Jaiwon Shin
- Airspace Systems Program Refinement – Dr. John Cavolowsky
- Uninhabited Aerial Systems in the National Airspace System – Mr. Jeff Bauer
- Aviation Safety Program Update – Dr. Amy Pritchett
- Aeronautics Test Program Update, Strategic Plan and Future Plans – Mr. Tim Marshall
- Fundamental Aeronautics Program Update – Mr. Jay Dryer
- Integrated Systems Research Program Overview and NRC Meeting of Experts – Ms. Jean Wolfe
- Environmentally Responsible Aviation Project Overview – Dr. Fay Collier



Plans for Recovery Funds

The Aeronautics Research Mission Directorate will invest \$150M of Recovery Act funds to reduce risk and enhance fidelity of current planned research within the programs, and to support test infrastructure improvements

Aviation Safety Program (+\$14.3M)

- Enhance and expand fidelity of current research activities including composite materials and structures experimentation, simulations, and flight tests
- Research the expansion of available methods for the V&V of Flight Critical Systems in response to a JPDO-identified capability gap

Airspace Systems Program (+\$31.5M)

- Accelerate progress and initiate integrated system research in key areas in order to support the FAA/NASA Research Transition Team's requirements and R&D gaps identified by JPDO for the Next Generation Air Transportation System (NextGen) advancements
- Develop concept of operations requirements and analysis for government UAS access to the NAS in near term and for civil UAS access in the long term, in cooperation with other agencies

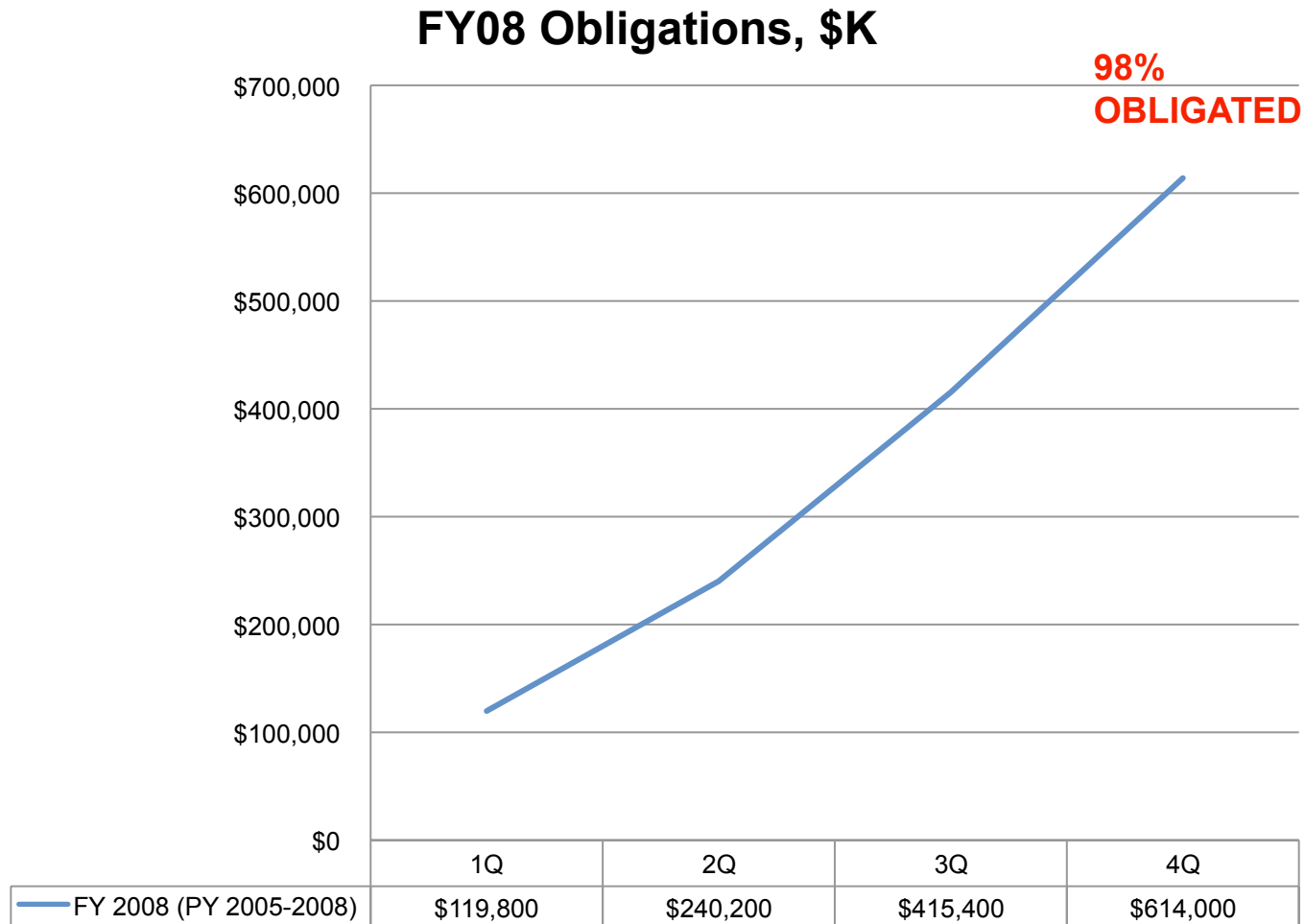
Fundamental Aeronautics Program (+\$54.6M)

- Reduce risk, accelerate progress, and conduct integrated system research in key areas that have applicability to future vehicle concepts that will reduce the impact of aviation on the environment
- Re-establish a national capability to test large-scale prop-rotors to enable advanced research into tilt-rotor analysis and validation

Aeronautics Test Program (+\$46.6M)

- Invest in ATP facilities to enable and enhance ongoing and new research opportunities within the ARMD research programs

ARMD FY08 Obligation Rate



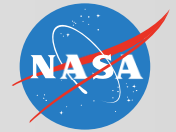
Recovery Act Projects – Sustaining and Increasing Capability



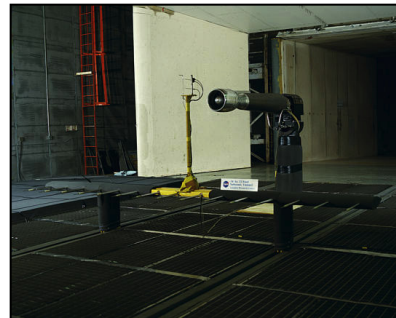
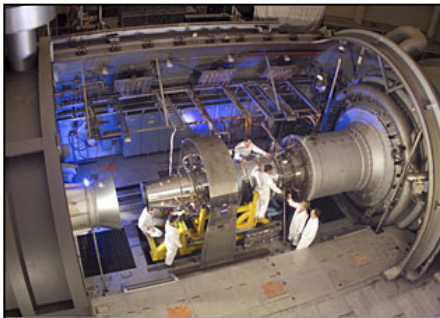
- Reliability Improvements for the Unitary Plan Wind Tunnel Air Compression System, Ames Research Center
- New Refrigeration System for the Icing Research Tunnel, Glenn Research Center



Recovery Act Projects – Sustaining and Increasing Capability



- Ice Crystal Capability at the Propulsion Systems Laboratory, Glenn Research Center
- 14 x 22 Facility Modifications to Support Environmentally Responsible Aviation (ERA) Project, Langley Research Center
- National Transonic Facility Improvements, Langley Research Center





NASA Innovation & Technology Initiative

Mike Ryschkewitsch & Laurie Leshin
Presentation to the NASA Advisory Council
July 14 2009

Council Observation

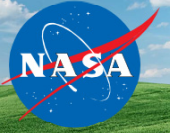
The NAC is encouraged by the ongoing assessment of advanced technology development in the agency. We look forward to a report on the “Innovation and Technology Initiative” addressing increased emphasis in this important area. We recommend that the NAC consider the results of this study at the next Council meeting.

February 2009 Committee Recommendation

Recommendation: Convene workshop to provide external community input to NASA's formulation of the system-level program on Environmentally-Responsible Aviation (ERA)

Details: NASA should convene a small, 2-step workshop under the NAC Aeronautics Committee to provide external community input to NASA's formulation of the system-level program on Environmentally-Responsible Aviation (ERA). NASA should plan to cover the preliminary plans for both the operations and vehicle themes of the program at the workshop, including the plans for integration of the two themes. Both workshops should be completed by June 30, 2009 to precede the FY2011 agency budget submit.

NRC Meeting of Experts Summary



- **May 14-15, 2009**
- **Objective**
 - Obtain external community input on NASA Plans for System-level Research in Mitigating the Impact of Aviation on the Environment
- **Two break-out sessions**
 - Vehicle research
 - Operations research
- **Total Attendees: 64** {Subject Matter Experts – 19 (*4 NAC Aero Committee Members*); NASA – 32; Public – 10; NRC – 3}
- **Weblink for presentations:**
<http://www.aeronautics.nasa.gov>

Mission/Program Comments from NRC MoE

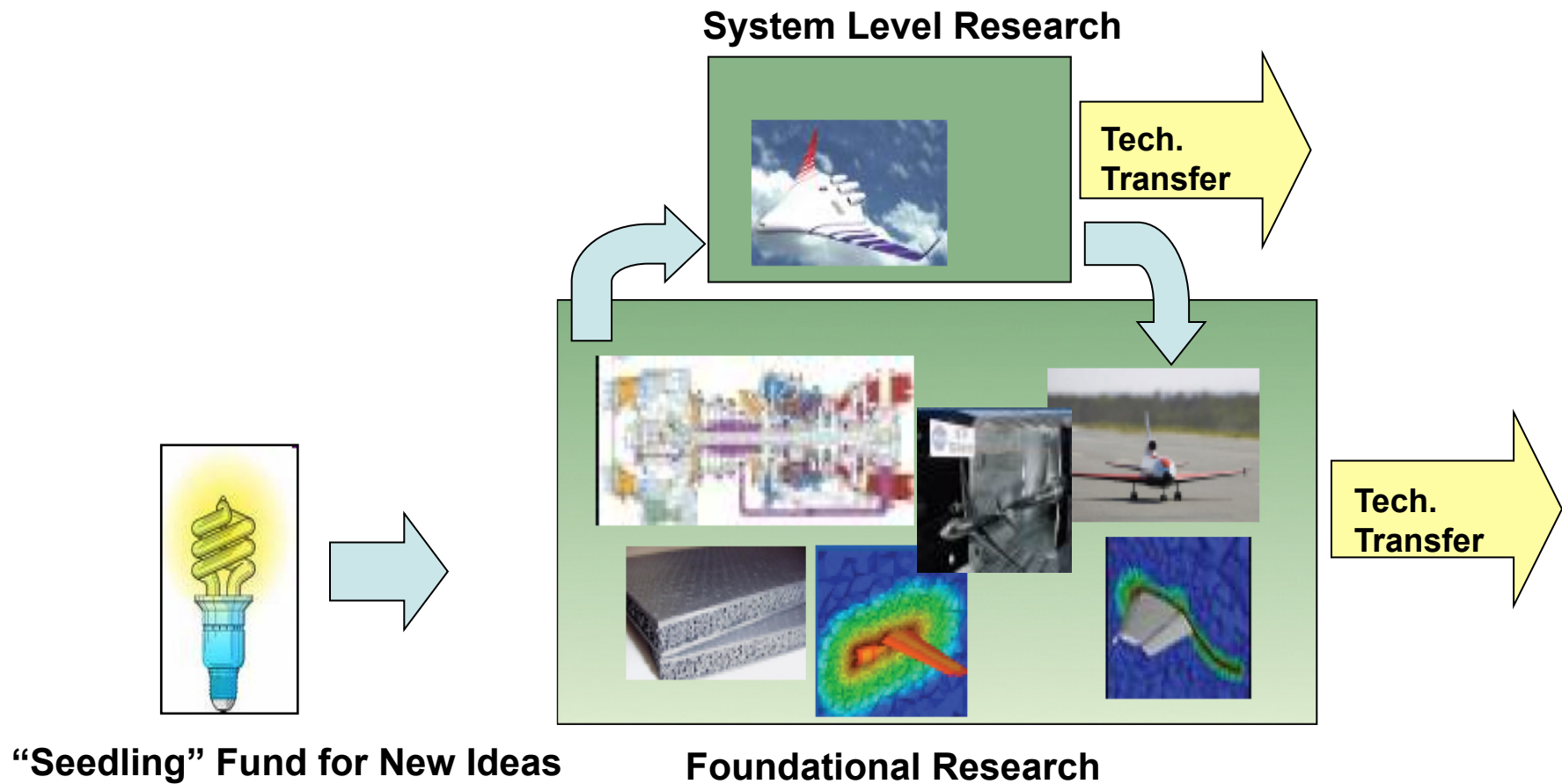
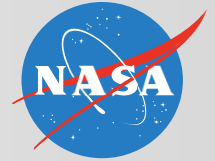


Comment	Disposition
Re-introduction of integrated system-level research into NASA program very important and positive step.	NASA will continue to pursue additional system-level research as technologies mature in the foundational base programs and external drivers exist.
Exciting program -- looking forward to hearing more.	ISRP and ERA will continue to take advantage of outreach opportunities. AIAA Meetings (ATIO in Hilton Head), SAE Meetings (WAC in Seattle), FAP Annual Meeting (Atlanta), etc. In the past few weeks, we have continued to spread the word at AIAA APA in San Antonio, and SFW Aerothermodynamics TWG at IGTE in Orlando.
CO2 emissions from aviation: 2% is a low estimate. The important thing is that it is a growing number and will be more significant in the future, which Jai pointed out correctly. One thing to remember is that the impact on global climate from aviation.	The statistic and source are being checked.
American Recovery Act and FY09 Congressional augmentation. Details? How are these funds being invested and how do they relate to the topic of discussion, priming ERA? Front-loading efforts? <i>(Note: it was later clarified that this cannot be shared yet).</i>	Congress approved the NASA Operating Plan, including details of spending plans of the American Recovery Act funds, and those details are to be shared with the NAC Aeronautics Committee at the July meeting.

Summary of NRC MoE

- The recommendation was satisfied
- The Aeronautics Committee and external community were pleased with the planning and outreach process. They agreed with the planned emphasis and direction of the program.
- The comments and feedback helped improve the content of the program.
- ARMD provided the Committee with a summary of the feedback. This summary will be provided to the subject matter experts that attended the meeting and will be posted to the ARMD website by mid August.

Vision for NASA Aeronautics



Enabling “Game Changing” concepts and technologies from advancing foundational research ultimately to understand the feasibility of advanced systems

Airspace Systems Program Refinement



NextGen - Concept and Technology Development Project

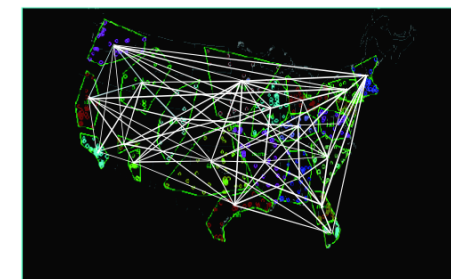
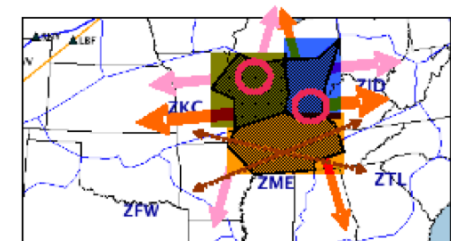
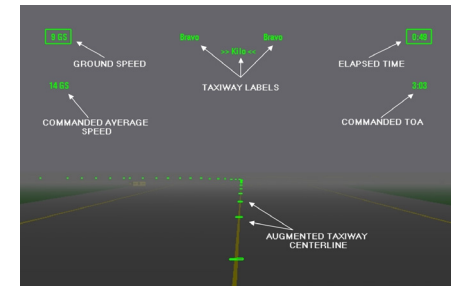
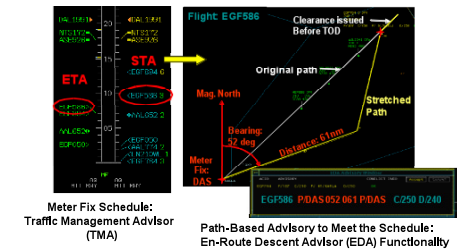
- Enhance state-of-the-art of ATM research
- Concept development
- Initial algorithm development
- Initial software development
- Initial analysis and/or human-in-the-loop simulation
- Initial determination of concept/technology feasibility and benefits

NextGen - Systems Analysis, Integration, and Evaluation Project

- Assess collective impact of technologies
- Receives concepts that are matured to a level where integration and interdependency considerations outweigh fundamental research
- Skill set required to mature further is broader than foundational research project

Research Transition Team Descriptions

- Efficient Flow into Congested Airspace: Joint collaboration with industry partners for near-term efficient and reduced environmental impact of arrival operations under constrained airspace conditions.
- Integrated Arrivals/Departures/Surface Management: Develop system level concept to accelerate NextGen arrival/departure and surface operations for the mid-term.
- Multi-Sector Planner: Engage System-Operations to determine roles and responsibilities for efficient flow of traffic for the mid-term.
- Dynamic Airspace Configuration: Develop far-term concept for efficient partitioning of airspace and allocation of resources to meet NextGen capacity needs.



Next Meeting

- Update from Air Force Research Lab (AFRL) Applied Technology Council on technology transition
- Status from ARMD of NASA/FAA/JPDO Research Transition Teams
- Update from ARMD on ISRP/ERA Plans

Back-up

THE NATIONAL

ACADEMIES

Assessment of NASA Laboratory Capabilities

**Laboratory Assessments Board
Aeronautics and Space Engineering Board
Space Studies Board**

Co-Chairs: Tom Best and Joseph Reagan

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